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INDUSTRIAL FISHERY PRODUCTS

MARKET REVIEW AND OUTLOOK

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SUMMARY

In the first 10 months of 1977, U.S. production and imports of major industrial fishery products were less than a year earlier. Most of the decline was in the third quarter. Despite lower supplies, prices of these commodities remained relatively weak through early December 1977, after having declined sharply in May-July 1977.

Most of the decline in U.S. output in January-October 1977 from a year earlier was attributed to lower landings of menhaden. In addition, the output of fish oil fell more (37 percent) than the output of fish meal (down 10 percent) and fish solubles (down 5 percent), principally because the smaller average size of fish in the menhaden catch reduced the oil yield.

The decline in imports in the first 10 months of 1977 from a year earlier was associated with significantly lower output in major exporting countries. Most of the decline in imports was in the third quarter, when prices in the United States were below those in Europe and Japan. This encouraged major exporting countries to ship products to destinations other than the United States.

U.S. new supplies of industrial fishery products are not expected to improve until May 1978 when landings of menhaden usually begin to move to seasonal highs. Landings of menhaden in 1978 are expected to equal or exceed landings in 1977, according to NMFS biologists, Beaufort, N.C. Imports are likely to continue low through 1978, because of resource-related constraints in major exporting countries. Imports will also be affected by relative prices in the United States, Europe, and Japan. In general, lower world supplies and growing world demand suggest a basis for price strength for industrial fishery products through early 1978, but price increases will be limited by sluggishness in prices for other feedstuffs.

FISH MEAL

New supplies of fish meal (production plus imports) totaled about 321,000 short tons in January-October 1977, 19 percent below a year earlier. Domestic production was down 10 percent, and imports were down 40 percent. Most of the decline in new supplies from year-earlier levels occurred in the third quarter. Through early December 1977, prices of fish meal recovered only slightly from the sharp decline of mid-1977.

Domestic Production

U.S. production of fish meal was about 246,000 short tons in the first 10 months of 1977, down 10 cent from 1976 (table 1). Lower produc-

tion of menhaden meal in the third quarter accounted for most of the overall decline of about 26,000 short tons.

Table 1.--U.S. supplies of fish meal, January-October 1976 and 1977, and 1966-75 annual average

Component	1966-75 annual average	Jan.- Oct. 1976	Jan.- Oct. 1977	Change 76 to 77
	-Thousand short tons-			-Percent-
Production 1/				
Menhaden 2/	174.4	204.1	185.4	- 9
Anchovy	12.3	12.4	13.2	+ 6
Tuna - mackerel	33.5	32.7	27.6	- 16
Unclassified	34.5	22.4	19.4	- 13
Total	254.7	271.5	245.6	- 10
Imports	349.5	124.8	75.2	- 40
New supplies	604.1	396.3	320.8	- 19
Exports	3/ 23.2	23.8	30.5	+ 28
Supplies, total	580.9	372.5	290.3	- 20

1/ Excludes shellfish meal; figures for 1977 subject to revision.
2/ May include small quantities made from other species.
3/ Average for 1970-76.

Note: Computations based on figures prior to rounding.

Total landings of menhaden used for reduction were 1,653 million pounds in January-October 1977, down 13 percent from last year. For the Atlantic coast, landings were 674 million pounds, only about 8 percent higher than last year, and fishing effort was about the same according to NMFS biologists at Beaufort, N.C. 1/ Gulf coast landings fell about 21 percent from last year to 980 million pounds; fishing effort was 8 percent less.

1/ Through November 1977, Atlantic coast landings were 702 million pounds, about 2 percent less than last year, but fishing effort was 2 percent more than last year, an estimated 1,134 vessel-weeks.

During the first 10 months of 1977, the production of tuna-mackerel meal was 27,597 short tons, down 16 percent from a year earlier. This decline may be explained by the reduced cannery receipts of tuna during a period of about 2 months when the U.S. tuna purse seine fleet was not fishing because of court litigation about the level of incidental porpoise catch. Later, during the third quarter of 1977, the production of tuna-mackerel meal was much closer to year-earlier levels.

The production of anchovy meal was 13,190 short tons in January-October 1977, up 6 percent from last year. Landings of the anchovy reduction fishery in California surpassed year-earlier levels in the new season which began in September. This improvement offset the decline for the first half of the year. 2/

The production of unclassified meal was 19,440 short tons in the first 10 months of 1977, 13 percent less than a year earlier. Most of this decline occurred in the third quarter.

U.S. Imports and Exports

U.S. imports of fish meal during the first 10 months of 1977 were about 75,000 short tons. This was 40 percent less than in 1976, mostly because of the absence of imports from Peru since February 1977. U.S. exports rose 28 percent to about 30,000 short tons. Most of the drop in imports and most of the increase in exports occurred from May onward.

Norway, Canada, and Peru were the leading suppliers of imported fish meal during January-October 1977. Imports of fish meal from Norway were 23,607 short tons--87 percent above 1976. Imports from Canada fell 31 percent to 21,053 short tons, still exceeding the 15,578 short tons from Peru. Imports from Peru were 78 percent below the 1976 level. Imports of fish meal from all other countries rose 35 percent from a year earlier to 14,944 short tons, primarily because of increased imports from Panama, which were based on the improved resources and anchovy catches.

Recent prices affected both imports and exports in such a way that supplies of fish meal available for use in the United States were reduced. In July-October, when European prices exceeded U.S. prices for fish meal, exports

2/ The season opened on August 1, 1977, in the Northern Permit Area, which has a landings quota of 15,000 short tons for the season, and on September 15, 1977, in the Southern Permit Area, which has a quota of 100,000 short tons. The season will close on May 15, 1978, as it did in 1977.

exceeded normal levels (fig. 1). Most of the U.S. exports in the first 10 months of 1977 occurred in July-October. Most of the increase in exports went to West Germany. Earlier in 1977, European prices were lower than comparable U.S. prices, and U.S. exports were below normal levels. Similarly, the change in relative prices appears to have affected imports of fish meal from Norway, the leading supplier in 1977. Imports from Norway were well above normal levels in the second quarter when prices of fish meal in the United States exceeded comparable European prices, but then fell below normal levels in July-October when European prices became higher.

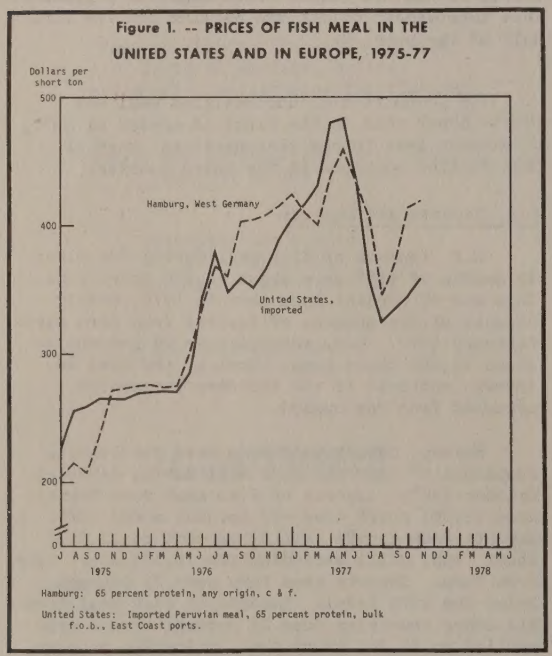


Figure 1. -- PRICES OF FISH MEAL IN THE UNITED STATES AND IN EUROPE, 1975-77

Hamburg: 65 percent protein, any origin, c & f.

United States: Imported Peruvian meal, 65 percent protein, bulk f.o.b., East Coast ports.

Table 2.--Supply and utilization of fish meal for major exporting countries, January-September 1976 and 1977

Component	January-September		Change
	1976	1977	
	Metric tons		Percent
Beginning stocks	185,005	329,316	+ 78
Production	1,500,506	1,174,616	- 22
Total supply	1,685,511	1,503,932	- 11
Exports	1,056,025	872,849	- 17
Domestic consumption	261,065	243,737	- 7
Total disappearance	1,317,090	1,116,586	- 15
Ending stocks	367,675	387,755	+ 5

Note: For details, refer to appendix table A6.

Developments in Major Exporting Countries

Production of fish meal by the five major exporting countries during January-September 1977 fell 22 percent from a year earlier to 1.2 million metric tons (table 2). Despite this drop in production, exports declined only 17 percent to 872,849 metric tons, because of high beginning inventories.

Peru accounted for the largest part of the decline in fish meal production among major exporting countries. Peru produces fish meal mainly from anchovy, but the anchovy resources off the Peruvian coast are apparently at a very low level, reportedly 2 to 3 million metric tons. Anchovy resources were an estimated 15 to 20 million metric tons when catches reached 9 to 12 million metric tons in 1967-71, but those catches were apparently in excess of what could be sustained, and the resources began to decline. Resources were further reduced by the recurrence of adverse oceanic conditions in 1972, and they could support catches of only 2 to 4 million metric tons in 1972-76. The lower level of resources in 1977 traces to a unique combination of adverse ocean conditions in 1976. Reportedly, the health and spawning of adult anchovy were impaired, and the survival and growth of juvenile anchovy were reduced. Ocean conditions reportedly improved about May 1977, prior to the time of spawning (mostly in August and September), but the initial increase in anchovy stocks will not reach harvestable size until 1978. Even so, two groups of scientists (FAO and IMARPE) had recommended abstaining from fishing the stocks for 2 years. 3/

The very low level of Peruvian anchovy resources in 1977 reduced the catch directly, and led to regulations intended to conserve and rebuild the resources. After a brief opening and closure in April-May 1977 for the major grounds (excluding the extreme southern grounds, near Chile, which did not close), fishing for reduction

3/ FAO: Food and Agriculture Organization of the United Nations; IMPARPE: Instituto del Mar del Peru.

purposes was permitted to begin again on August 17. At that time fishing was reportedly permitted only for species other than anchovy (with up to 10 percent incidental catch of anchovy), only for 5 days per week, and only farther than 15 miles from shore. Initially, the list of other species that may be used for reduction included sardines, jack-mackerel (jurel), and mackerel, but sardines were excluded as of November 12, 1977. The regulations contained other provisions, including restrictions on fishing by area.

Because of lower resource levels, South Africa also had a substantial drop in production of fish meal in January-September 1977 compared with a year earlier. On the other hand, Iceland increased production almost 50 percent through September to 142,385 metric tons, primarily on the basis of bountiful resources of capelin within their 200-mile fishing zone. Capelin is also the leading species in Norway's fish-reduction industry, whose production of fish meal was 384,276 metric tons in the first 9 months of 1977, about one third of the total for all five major exporting countries, and about 1 percent behind last year. Through November, the Norwegian catch for reduction purposes was about 2 percent ahead of a year earlier.

In July-September 1977, landings of fish for reduction in Denmark declined 25 percent from a year earlier, although the January-September catch was down only 6 percent and the January-June catch was up 7 percent. The explanation of the July-September decline appears to be that the numerous bans and restrictions on the reduction fisheries are having an impact that was not experienced in the first half of 1977. Additional regulations will further reduce the catch in late 1977 and in 1978. (See Outlook.)

Developments in Major Importing Countries

Imports of fish meal by most major importing countries were lower in January-September 1977 than a year earlier, but imports by Japan rose (table 3).

Japan is a major producer and consumer of fish meal. In 1977, imports were increased and exports were reduced, apparently in anticipation of reduced catches off the coasts of other countries (notably the United States and the Soviet Union) as those countries began to give preference to their own fishermen under the new extended jurisdiction laws. Although fishing agreements between Japan and the Soviet Union were signed in mid-1977, the pattern of reduced exports and increased imports established by Japan in the first half continued in the third quarter. Peru was the leading supplier of fish meal imported by Japan in the third quarter of 1977, followed closely by Chile. Relative prices seem to account for the Peruvian shipments to Japan: While Peruvian fish meal was selling for $335 per short ton in the United States in September 1977, the comparable Japanese price was $476 per short ton ($476 per short ton was the average unit value of imports from Peru, excluding any duties on imports in excess of quotas, converted at 267 yen per dollar).

Prices

Following the sharp decline of mid-1977, prices of fish meal remained relatively weak, even with lower supplies. For example, the wholesale price of menhaden meal was $363 per short ton in November 1977, 25 percent below the May 1977 price of $486, and about 1 percent below the price of November 1976 (fig. 2). Although

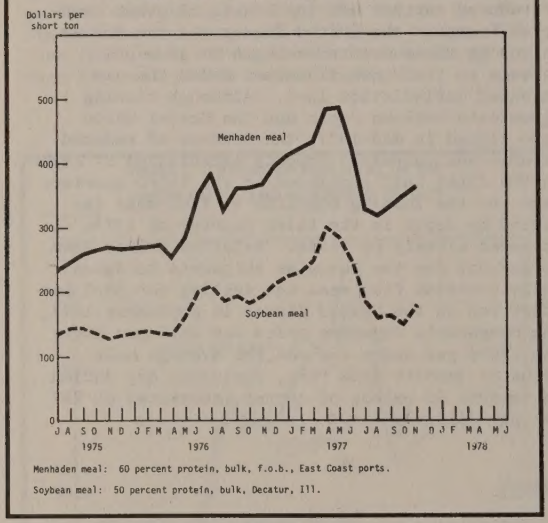
Table 3.--Fish meal imports by selected countries, 1975-76 annual average, and January-September, 1976 and 1977

Country	1975-76 annual average	January-September 1976	January-September 1977	Change 1976 to 1977
	Thousand metric tons			Percent
West Germany	332	216	197	- 9
East European countries 1/	378	289	257	- 11
United Kingdom	246	196	162	- 17
United States	117	99	66	- 33
Japan	64	54	141	+161

1/ Exports to the Soviet Union and other unspecified socialist countries only from countries which are members of the Fishmeal Exporters Organization (FEO).

November 1977 prices were lower than May 1977 prices, fish meal exhibited greater price strength than soybean meal: the ratio of prices of fish meal to prices of soybean meal rose from 1.70 in May to 2.01 in November 1977 (appendix table A8).

Figure 2. -- PRICES OF MENHADEN MEAL AND SOYBEAN MEAL, 1975-77



Menhaden meal: 60 percent protein, bulk, f.o.b., East Coast ports.

Soybean meal: 50 percent protein, bulk, Decatur, Ill.

The sharp decline of feedstuff prices in mid-1977 apparently reflected both the realization that carryover supplies of soybeans were larger than had been previously estimated and the forecasts of larger harvests of soybeans, other oilseeds, and feed grains. After declining sharply, prices remained weak through early December, because the market perceived that supplies were adequate to meet foreseeable demand at the lower level of prices. On the other hand, the increase in the ratio of fish meal prices to soybean meal prices since May 1977 may be explained by the decline in new supplies of fish meal from year-earlier levels, particularly in the third quarter. That is, new supplies (domestic production plus imports) of 144,000 short tons of fish meal in the third quarter of 1977 were about 29 percent below year-earlier levels, but new supplies in the first half (154,000 short tons) were only 3 percent lower.

OUTLOOK

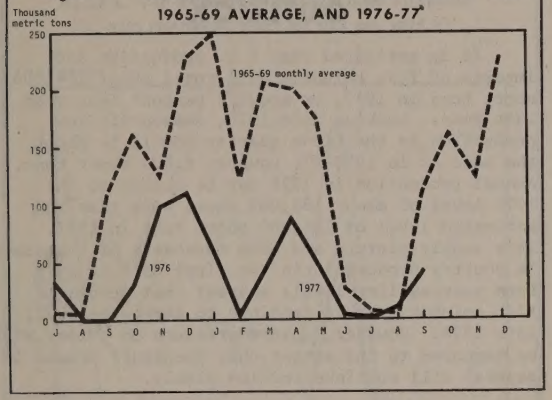
U.S. supplies of fish meal are expected to total about 350,000 short tons in 1977, down about 20 percent from a year earlier. This includes domestic production of about 270,000 short tons, and imports of about 80,000 short tons. Looking into 1978, domestic production in the first quarter should be about the same as in 1977, and the annual total may be about the same as or slightly higher than in 1977. Imports will probably remain low. This supply picture, and USDA forecasts for increased poultry production on the demand side suggest that fish meal should have a basis for price strength well into 1978; however, fish meal prices can rise only to the extent that other feedstuff prices rise.

In 1978, it is likely that production of menhaden meal will be equal to or better than in 1977, according to preliminary estimates (as of December 1977) by NMFS biologists. Through November of the 1977-78 season, landings in the anchovy reduction fishery of California were about 65,000 short tons, roughly 50 percent ahead of year-earlier levels, but the season quota is lower (115,000 vs. 135,000 short tons of landings through May 15). We estimate that production of tuna-mackerel meal and meal from unclassified species will be about the same as a year-earlier in the first quarter of 1978, and for all of 1978.

Imports of fish meal through early 1978 will be influenced by relative prices in Europe, the United States, and Japan. For example, United States imports from Norway, the leading supplier in 1977, were well below 1966-75 average levels in the third quarter when European prices were higher than U.S. prices (fig. 1), but well above 1966-75 average levels in the second quarter when U.S. prices were higher than European prices. Imports from Canada, the second leading supplier in 1977, will likely continue at reduced levels (about one-third lower than year-earlier levels in the first 10 months of 1977) because of resource constraints and gradual increases in the use of herring for human food rather than for reduction. Imports from Peru, normally the leading supplier, should continue low through mid-1978, as there is no indication that Peruvian supplies will improve very much.

Peruvian production of fish meal normally increases seasonally beginning in September (fig. 3), but available information suggests that production may continue to be well below historical levels through 1978. The revised catch target is 2 million metric tons for 1977 for reduction purposes, considerably lower than the earlier target of 4.5 million metric tons. This means that 0.5 million metric tons of catch for reduction would be needed in October-December 1977, since the catch through September was an estimated 1.5 million metric tons. This seems achievable, judging by catch rates that have been reported recently. Looking into 1978, the catch target is 2 million metric tons, the same as for 1977.

Figure 3. -- MONTHLY PRODUCTION OF FISH MEAL IN PERU: 1965-69 AVERAGE, AND 1976-77



In addition to the decline in catch of Peruvian anchovy, world supplies of fish meal will be influenced by resource-related constraints in other major producing-exporting countries. The European Economic Community (EEC) imposed a ban on fishing for herring for reduction in the North Sea until January 31, 1978, and the ban may last until the end of 1978. There was also a partial ban on fishing for Norway pout, another species used for reduction. The EEC failed in late October to extend the ban on the Norway pout fishery in the "window" northeast of Scotland, but soon after the United Kingdom reintroduced it unilaterally. In the Barents Sea, it is expected that the capelin catch will approach 3 million metric tons in 1977. It is estimated that Norway's catch of capelin will reach about 2 million metric tons in 1977, roughly the same as in 1976. However, catch by the Soviet Union from the same resource in the Barents Sea, about 0.7 million metric tons in 1976, has been increasing. The combination of rising Soviet catch and the possible implementation of catch quotas will limit growth in Norway's catch of capelin, now that country's leading species in the production of fish meal and oil. In the herring fishing grounds west of Scotland, quotas have been in effect in 1977. For the mackerel fisheries off the southwest coast of England, there has been an increasing possibility of reduced allocations. While catches have been ahead of 1976 levels, the authorities (EEC and UK) are attempting through regulatory measures to reduce the percentage of the mackerel being used for reduction purposes and to increase the percentage for direct human consumption.

As mentioned previously, the decline in Danish landings for reduction purposes in July-September 1977 from a year earlier appears to have resulted from the increasing number of bans and restrictions. They will have a significant effect in the rest of 1977 and in 1978. In the Baltic Sea, an international governing commission (which met in early September 1977) reduced Denmark's herring quota in the Kattegat (between Denmark and Sweden) from 50,000 metric tons in 1977 to 28,000 metric tons in 1978. The Kattegat is now a more important source for Danish herring landings since herring fishing for reduction purposes was banned in the North Sea in mid-1977. Of course, the Danish fish-reduction industry depends less on herring than in the past because other species have become more important. Besides these constraints on herring catch, it has been reported that Danish vessels stopped all fishing for reduction purposes within Norway's 200-mile zone as of November 1, 1977, because of the new Norwegian regulations. The Chairman of the Danish Sea Fishermen's Association reportedly predicted that the numerous bans and restrictions on fishing for reduction purposes would force a large part of the Danish reduction fleet out of business.

For the resources near the coast of Namibia (South West Africa), a severely reduced catch quota for pilchards was initiated as a result of a scarcity of fish during research surveys in early 1977. The catch of industrial fish near the coast of South Africa improved, but not enough to prevent the reduction in exports from South Africa because of the drop in catch off Namibia. Reportedly, it has been estimated that the pilchard catch off Namibia may fall to 150,000 metric tons in the 1978 season from roughly 200,000 metric tons in the 1977 season.

Even though U.S. supplies of fish meal during the rest of 1977 and early 1978 may be limited by the reduced level of domestic production in 1977 and continuing low imports, there are indications that demand will continue to grow. Poultry production is expected to increase from a year earlier through the first half.

While the combination of strong demand and reduced supply point to price strength for fish meal, price gains will be limited if prices of feedstuffs in general do not recover. As already mentioned, prices of fish meal have shown greater strength than prices of soybean meal, but have remained well below May 1977 levels through early December.

FISH SOLUBLES

U.S. supplies of fish solubles were lower in January-October 1977 than in 1976 (table 4). Most of the decline was in the third quarter. Prices remained steady in August-November 1977, well below the levels of April-June.

Table 4.--New supplies of fish solubles in the United States, January-October 1976 and 1977

Component	January-October		Change
	1976	1977	
	Short tons		Percent
Production			
Menhaden 1/	89,943	85,230	- 5
Unclassified	28,804	27,557	- 4
Total	118,747	112,787	- 5
Imports	732	729	0
Total new supply	119,479	113,516	- 5

1/ May include small quantities made from other species.

Note: Figures for 1977 are subject to revision.

U.S. production of fish solubles was about 113,000 short tons in the first 10 months of 1977, 5 percent less than last year but 18 percent ahead of the 1966-75 average. Most of the decline from year-earlier levels was in menhaden solubles, which accounted for 76 percent of the 10-month total production of fish solubles. Production of fish solubles from unclassified species fell by 4 percent, a slightly smaller drop than for menhaden.

Like the prices of fish meal and other feedstuffs (figs. 1 and 2), the prices of fish solubles have remained well below the levels of April-June 1977. The price of menhaden solubles (in tank cars, f.o.b. east coast plants) in October 1977 averaged $126 per short tons, compared with $177 in May 1977 and $130 in October 1976. Prices of fish solubles strengthened relative to prices of fish meal in 1977.

OUTLOOK

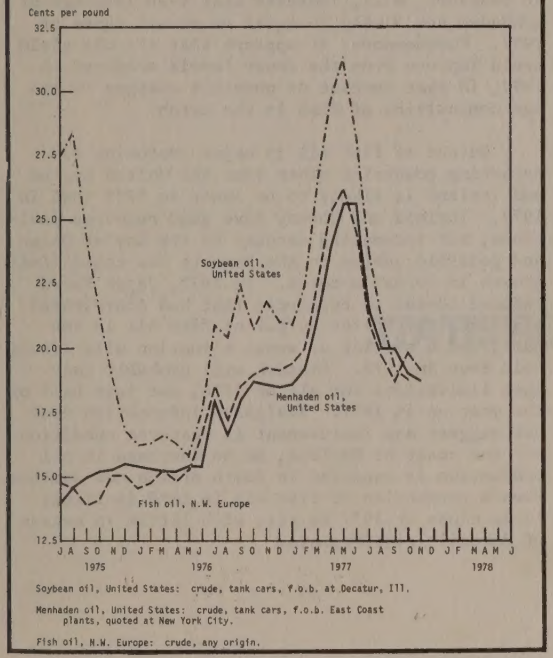
It is estimated that U.S. production and imports of fish solubles will total about 124,000 short tons in 1977, or about 7 percent less than last year. Looking into 1978, seasonally low production in the first quarter should be about the same as in 1975-77, roughly 8,000 short tons. Annual production in 1978 may be closer to the 1976 level of about 133,000 short tons than the estimated level of 124,000 short tons in 1977. This supply picture and USDA forecasts of increases in poultry production in the first half of 1978 from year-earlier levels suggest that prices of fish solubles should continue to strengthen well into 1978. However, upward pressure on prices will be tempered to the extent that feedstuff prices in general will continue to rise slowly.

FISH OIL

During January-October 1977, U.S. production, consumption, and international trade of fish oil declined compared with last year (table 5). Prices for fish oil responded to the situation of tighter supplies, although this is difficult to visualize in the general pattern of a sharp rise and fall that has characterized leading oil prices in 1977 (fig. 4).

U.S. production of fish oils other than menhaden oil was 14.4 million pounds in the first 10 months of 1977, 3 percent higher than last year. Increased production of anchovy oil and tuna-mackerel oil more than offset the lower production of fish oil from unclassified species. Production of anchovy oil increased with the beginning of the new season of the California reduction fishery for anchovy. Before the new season began, the 1977 production of anchovy oil was well behind year-earlier levels. Increased production of tuna-mackerel oil apparently resulted from higher cannery receipts of mackerel, since receipts of tuna were lower than a year earlier. The above-normal production of tuna-mackerel oil in May--2.4 million pounds compared to the 1966-77 average for May of 0.4 million pounds--offset lower production in other months. Through July 1977, production of fish oil from unclassified species had been ahead of year-earlier levels, but declines in August, September, and October caused 10-month production to drop below year-earlier levels.

Figure 4. -- U. S. PRICES OF FISH OIL AND SOYBEAN OIL, AND EUROPEAN PRICE OF FISH OIL, 1975-77



Soybean oil, United States: crude, tank cars, f.o.b. at Decatur, Ill.

Menhaden oil, United States: crude, tank cars, f.o.b. East Coast plants, quoted at New York City.

Fish oil, N.W. Europe: crude, any origin.

Table 5.--U.S. supply and utilization of fish oil, January-October, 1976 and 1977, and 1966-75 annual average

Component	1966-75 annual average	January-October 1976	January-October 1977	Change 1977/1976
	-Million pounds-			-Percent-
New supplies				
Production				
Menhaden 1/	177.5	184.8	111.7	- 40
Anchovy	5.0	2.7	3.6	+ 33
Tuna-mackerel	5.2	5.1	5.6	+ 10
Unclassified	11.2	6.3	5.2	- 17
Total	198.9	198.8	126.2	- 37
Imports	8.3	20.7	13.8	- 33
Total	207.3	219.7	140.0	- 36
Utilization				
Exports	163.7	157.8	82.2	- 48
Consumption 2/	32.3	32.5	28.8	- 11
Total	196.0	190.3	111.0	- 42
Apparent stock change	+11.3	+29.3	+29.0	- 1

1/ May include small quantities made from other species.
2/ Utilization in inedible products only.

Note: Includes preliminary figures for 1977; figures may not add to total shown, because of rounding.

The production of fish oil in the United States was 126 million pounds in the first 10 months of 1977, 37 percent below last year (table 5). The decline was associated principally with menhaden oil, which accounted for nearly 90 percent of total production. Most of the decline was in the third quarter when U.S. production of menhaden oil was about half the level of last year. In January-October 1977, menhaden landings fell only 13 percent from a year earlier, but production of menhaden oil dropped 40 percent to 112 million pounds. The decrease in production of menhaden oil was attributed primarily to the smaller average size of fish in the catch, which resulted in a lower oil yield.

Prices of fish oil strengthened in summer 1977 in response to the reduced supplies of fish oil. U.S. prices of menhaden oil were above comparable European prices in July-September 1977 (fig. 4). Furthermore, prices of menhaden oil even exceeded prices of soybean oil in the United States in September and October (fig. 4). Historically, prices of menhaden oil have been about 30 percent below prices of soybean oil (1966-75 average), although they were only 10 percent lower on the average in 1976. The closing of the gap between prices of menhaden oil and soybean oil in 1976 was a reflection of the reduced supplies of fish oil available in domestic and international trade channels since 1975. Prices in 1977 suggest that supplies of fish oil are becoming even more constrained relative to demand.

The fact that prices of fish oil were higher in the United States than in Europe during June-September 1977 (fig. 4) may help explain the decline in U.S. exports of fish oil in July-October 1977 from both year-earlier and 1966-75 average levels for the same months. Exports were particularly lower in July, September, and October.

Like the United States, most other major producing and exporting countries produced less fish oil in 1977 than in 1976. Iceland appears to be the only exception. Three factors have contributed to the decline in output of fish oil in other countries: reduced resources, restrictions on fishing, and reduced oil yields. Norway, the leading exporter of fish oil in 1975-77, had about the same landings for reduction through October 1976 and 1977, but oil yields were lower in 1977. Denmark and Japan experienced restrictions on fishing from resources that had in the past contributed significantly to their output. Lower production in South Africa and Namibia (South West Africa) was associated with a decline in the pilchard resources off the coast of Namibia. Peru's production of fish oil was about the same as domestic utilization in 1976, and may be less than domestic utilization in 1977. Consequently, Peru exported little, if any, fish oil in 1976 and 1977 compared with an average of 100,000 metric tons in 1974-75. Even

though Peru's catch for reduction purposes rose from 3.1 million metric tons in 1975 to 3.9 million metric tons in 1976, production of fish oil fell from 212,000 to 109,000 metric tons. It is possible that the 1977 target catch of 2 million metric tons could result in production of 80,000 to 100,000 metric tons of fish oil, because of the change in species composition of the catch and the improvement in oceanic conditions during at least part of the year. It is less likely that the oil yield in 1977 will average the same as in 1976, in which case the 2 million metric tons of catch would result in production of only about 56,000 metric tons of fish oil--far below the 1975-76 average domestic utilization of about 100,000 metric tons.

OUTLOOK

We estimate that U.S. production of fish oil could improve in 1978 when the menhaden fisheries move to seasonal highs beginning in May. World output seems likely to decline. This supply situation coupled with the likelihood that world demand will grow suggest that price strength for fish oil will continue, but price increases will be limited by what may prove to be relatively good total supplies of fats and oils well in 1978.

U.S. production of fish oil could improve in 1978, if production of menhaden oil moves closer to normal levels. Recent preliminary estimates (as of December 1977) by NMFS biologists at Beaufort, N.C., indicate that 1978 landings of menhaden are likely to equal or exceed those of 1977. Furthermore, it appears that the oil yield could improve from the lower levels achieved in 1977, in part because of possible changes in the age composition of fish in the catch.

Output of fish oil in major producing and exporting countries other than the United States and Iceland is likely to be lower in 1978 than in 1977. Iceland and Norway have good resource positions, but increasing catches by the Soviet Union and possible quotas in the Barents Sea could limit growth in Norway's catch. In 1977, Japan faced reduced access to resources that had contributed significantly to the output of fish oil in the past, and a similar or worse situation will likely hold true in 1978. Denmark will probably face such limitations for all of 1978, not just half of the year as in 1977. Available information does not suggest any improvement in resource conditions off the coast of Namibia, so no increase in oil production is expected in South Africa and Namibia. Peru's production of fish oil in 1978 is likely to be close ot 1977 levels, with little in excess of domestic requirements.

STATISTICAL APPENDIX

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this department. Use of funds for printing this publication approved by the Office of Management and Budget, July 26, 1973; this approval expires June 30, 1978.

Table A1.--Production and imports of fish meal in the United States by month, 1966-75 average, and 1975-77

Time period	Production				Imports				Total			
	1966-75 average	1975	1976	1977	1966-75 average	1975	1976	1977	1966-75 average	1975	1976	1977
	Thousand short tons											
January	4.4	6.7	6.5	5.2	25.7	1.7	4.1	10.3	30.1	8.4	10.6	15.5
February	4.0	4.7	4.0	2.7	23.5	0.7	2.5	8.9	27.5	5.4	6.5	11.6
March	5.2	5.6	6.1	7.9	28.9	1.5	8.0	3.4	24.1	7.1	14.1	11.4
1st quarter	13.6	17.0	16.6	15.8	78.1	3.9	14.6	22.6	91.7	20.9	31.2	38.4
April	12.0	11.2	17.6	12.7	34.6	17.1	6.0	9.8	46.6	28.3	23.6	22.4
May	27.4	35.6	25.0	24.3	30.1	2.4	21.8	9.7	57.7	38.0	46.8	34.0
June	41.4	42.6	42.1	47.2	34.6	3.6	14.6	11.7	76.0	28.3	56.7	58.9
2d quarter	80.8	89.4	84.7	84.2	99.3	23.1	42.4	31.2	180.1	112.4	127.0	115.3
July	47.4	53.5	55.7	45.5	34.0	24.8	13.1	6.9	81.4	78.4	68.9	52.4
August	41.6	38.3	54.1	39.8	32.0	14.3	12.6	7.7	73.6	52.6	66.7	47.5
September	28.9	32.5	41.8	40.4	29.0	13.8	26.3	4.0	57.9	46.3	68.1	44.4
3d quarter	117.9	124.3	151.7	125.7	95.0	53.0	51.9	18.6	212.9	177.3	203.6	144.3
October	18.6	23.2	18.6	19.9	27.1	13.4	15.8	2.8	45.7	36.6	34.4	22.7
November	14.2	13.5	14.9		23.1	22.7	10.8		37.3	36.1	25.6	
December	9.6	11.8	12.6		26.8	2.5	4.8		36.4	14.2	17.4	
4th quarter	42.4	48.5	46.1		77.0	38.5	31.4		119.4	87.0	77.5	
Total	254.7	279.2	299.0		349.5	118.4	140.4		604.1	397.5	439.2	

Note: Production excludes meal from shellfish. 1977 figures are preliminary.
Figures may not add to total because of rounding.

Source: NMFS, Data Management and Statistics Division; Bureau of the Census.

Table A 2.--U.S. fish meal production by species, by month, 1966-75 average, and 1976-77

Time period	Anchovy			Menhaden			Tuna and mackerel			Unclassified			Total		
	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1976	1977
	Thousand short tons														
January	1.3	3.1	0.7	0.1	0.3	1.1	1.9	2.5	2.4	1.1	0.6	1.0	4.4	6.5	5.2
February	0.8	1.0	.1	-	-	-	2.0	2.1	1.6	1.2	0.9	1.1	4.0	4.0	2.7
March	0.5	1.2	3.3	-	-	-	3.0	3.8	3.2	1.7	1.2	1.5	5.2	6.1	7.9
1st quarter	2.6	5.3	4.0	0.1	0.3	1.1	6.9	8.4	7.2	4.0	2.6	3.5	13.6	16.6	15.8
April	1.2	3.9	1.7	4.6	8.5	7.4	3.4	3.6	2.0	2.8	1.6	1.5	12.0	17.6	12.7
May	1.0	0.6	1/	20.3	18.9	20.0	3.0	3.3	2.3	3.1	2.2	2.0	27.4	25.0	24.3
June	-	-	-	34.1	35.7	41.3	3.2	3.2	2.5	4.1	3.2	3.3	41.4	42.1	47.2
2d quarter	2.2	4.5	1.7	59.0	63.2	68.8	9.6	10.1	6.8	10.0	6.9	6.8	80.8	84.7	84.2
July	0.1	-	-	39.1	49.2	39.5	3.1	3.4	3.3	5.1	3.2	2.7	47.4	55.7	45.5
August	0.1	-	-	33.2	46.5	34.2	3.2	3.7	3.6	5.1	3.9	2.1	41.6	54.1	39.8
September	0.8	0.7	2.1	20.9	34.0	31.4	2.8	3.7	3.8	4.4	3.4	3.0	28.9	41.8	40.4
3d quarter	1.0	0.7	2.1	93.2	129.7	105.1	9.1	10.7	10.7	14.6	10.5	7.8	117.9	151.7	125.7
October	2.2	1.9	4.6	10.7	10.9	10.3	2.0	3.5	2.9	2.7	2.3	2.1	18.6	18.6	19.9
November	2.3	4.7		7.8	5.5		2.5	3.5		1.6	1.2		14.2	14.9	
December	2.0	5.0		3.7	3.0		2.6	3.9		1.3	0.7		9.6	12.6	
4th quarter	6.5	11.6		22.2	19.4		8.1	10.8		5.6	4.2		42.4	46.1	
Total	12.3	22.2		174.4	212.6		33.5	40.1		34.5	24.2		257.7	299.0	

1/ Included with unclassified.
Note: Production excludes meal from shellfish.
Figures may not add to total because of rounding. 1977 figures are preliminary.

Source: NMFS, Data Management and Statistics Division.

Table A 3.--U.S. imports of fish meal by country of origin, by month, 1966-75 average, and 1976-77

Time period	Canada			Chile 1/	Norway			Peru			Other countries 2/			Total		
	1966-75 average	1976	1977	1966-75 average	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1976	1977
	Thousand short tons															
January	3.1	1.4	1.3	0.7	2.3	2.4	-	18.8	-	7.9	0.8	0.3	1.1	25.7	4.1	10.3
February	2.7	2.0	1.1	0.8	2.3	0.6	-	17.2	-	7.7	0.5	-	3/	23.5	2.5	8.9
March	3.7	2.6	2.0	3.3	1.3	3.5	-	20.3	-	-	0.3	1.9	1.4	28.9	8.0	3.4
1st quarter	9.5	6.0	4.5	4.8	5.9	6.5	-	56.3	-	15.6	1.6	2.2	2.6	78.1	14.6	22.6
April	3.4	3.1	2.1	3.5	1.3	2.9	5.2	26.1	-	-	0.3	3/	2.5	34.6	6.0	9.8
May	3.2	3.4	1.9	3.1	1.0	0.6	4.9	22.1	17.6	-	0.7	0.2	2.9	30.1	21.8	9.7
June	3.3	2.8	1.7	3.2	1.0	2.7	7.7	26.8	9.1	-	0.3	3/	2.3	34.6	14.6	11.7
2d quarter	9.9	9.2	5.7	9.8	3.3	6.1	17.8	75.0	26.7	-	1.3	0.3	7.7	99.3	42.4	31.2
July	4.5	3.9	2.1	1.9	1.5	-	3.6	25.3	6.6	-	0.8	2.6	1.1	34.0	13.1	6.9
August	5.8	4.5	3.2	4.5	1.8	-	2.2	19.4	6.9	-	0.5	1.1	2.3	32.0	12.6	7.7
September	5.8	3.6	2.8	1.9	4.2	-	-	16.9	20.4	-	0.2	2.3	1.3	29.0	26.3	4.0
3d quarter	16.1	12.1	8.1	8.3	7.5	-	5.8	61.6	33.9	-	1.5	6.0	4.7	95.0	51.9	18.6
October	5.5	3.3	2.8	3.0	2.3	-	-	16.1	9.9	-	0.2	2.6	-	27.1	15.8	2.8
November	3.2	2.0		2.9	3.1	-		13.7	8.8		0.2	-		23.1	10.8	
December	2.9	1.5		2.3	1.5	3.3		19.8	-		0.3	-		26.8	4.8	
4th quarter	11.6	6.7		8.2	6.9	3.3		49.6	18.7		0.7	2.6		77.0	31.4	
Total	47.3	34.0		31.3	23.5	19.9		242.5	79.4		4.9	11.1		349.5	140.4	

1/ Imports from Chile in 1976 and 1977 were nil, except in May 1977, when about 2,200 tons were received.
2/ Includes Chile, except in the 1966-75 average.
3/ Less than 50 short tons.

Note: Figures may not add to total because of rounding.

Source: Bureau of the Census.

Table A4.--U.S. exports of fish meal, by month, 1972-77

Time Period	1972	1973	1974	1975	1976	1977
	Thousand short tons					
January	-	3.0	8.9	2.0	1.5	0.5
February	0.3	1.6	8.8	3.4	0.2	0.1
March	0.3	2.6	1.1	0.9	0.3	0.4
1st quarter	0.6	7.2	18.8	6.3	2.0	1.0
April	0.1	3.0	3.9	0.6	2.7	0.3
May	-	0.5	1.9	0.3	0.6	2.6
June	0.1	3.2	3.3	1.2	0.1	0.3
2d quarter	0.2	6.7	9.1	2.1	3.4	3.2
July	0.3	2.4	7.3	0.1	1.7	2.7
August	0.4	1.1	8.9	0.1	2.4	5.2
September	1.9	0.8	8.0	0.4	6.4	6.7
3d quarter	2.6	4.3	24.2	0.5	10.5	14.6
October	1.7	3.5	1.7	0.8	7.9	11.8
November	1.8	3.7	0.6	1.2	3.0	
December	3.6	11.3	1.0	0.9	6.3	
4th quarter	7.1	18.5	3.3	2.9	17.2	
Total	10.5	36.7	55.5	11.9	33.1	

1/ Less than 50 short tons.
Source: Bureau of the Census.

Table A 5.--Broiler chicks placed in 21 States, and average broiler price at the farm by month, 1966-75 average, and 1975-77

Time period	Chicks placed				Percentage change in chicks placed			Broiler price at the farm		
	1966-75 average	1975	1976	1977	in 1975 from 1966-75 average	in 1976 from 1975	in 1977 from 1976	1975	1976	1977
	Million				Percent			Cents/lb		
January	243.3	273.5	299.8	316.1	+ 12.4	+ 9.6	+ 5.4	23.8	24.2	21.5
February	225.2	228.5	246.4	259.1	+ 1.5	+ 7.8	+ 5.2	24.3	25.2	24.0
March	257.3	237.4	264.1	276.7	- 7.7	+ 11.2	+ 4.8	23.5	24.4	24.3
1st quarter	725.8	739.4	810.3	851.8	+ 1.9	+ 10.0	+ 5.1	23.9	24.6	23.3
April	251.3	241.3	272.1	285.0	- 4.0	+ 12.8	+ 4.7	23.2	23.5	24.3
May	275.5	301.6	339.6	359.8	+ 9.5	+ 12.6	+ 5.9	24.6	24.6	24.3
June	248.6	243.8	273.4	285.8	- 1.9	+ 12.1	+ 4.5	27.6	24.3	24.7
2d quarter	775.4	786.8	885.1	930.7	+ 1.5	+ 12.5	+ 5.2	25.1	24.2	24.4
July	248.2	291.2	327.4	338.7	+ 17.3	+ 12.4	+ 3.5	29.7	25.0	26.2
August	237.6	230.5	253.8	254.6	- 3.0	+ 10.1	+ 0.3	29.1	23.8	23.9
September	210.8	224.1	247.2	255.6	+ 6.3	+ 10.3	+ 3.4	29.6	22.8	24.0
3d quarter	696.6	745.8	828.4	848.9	+ 7.1	+ 11.1	+ 2.5	29.5	24.3	24.7
October	222.2	264.7	284.5	310.4	+ 19.1	+ 7.5	+ 9.1	28.5	20.6	23.1
November	227.1	227.5	237.4	248.8	+ 0.2	+ 4.4	+ 4.8	27.0	19.4	
December	230.0	234.5	244.1		+ 1.6	+ 4.1		24.0	19.3	
4th quarter	679.3	726.7	766.0		+ 6.8	+ 5.4		26.5	19.8	
Total	2,877.1	2,998.7	3,289.8		+ 4.2	+ 9.7		26.2	23.6	

Note: Figures may not add to total because of rounding. 1977 figures are preliminary.

Sources: Delmarva Broiler Chick Report, U.S. Department of Agriculture, Statistical Reporting Service, and Poultry and Egg Situation, U.S. Department of Agriculture, Economic Research Service.

Table A.6 --Supply and utilization of fish meal in major exporting countries, January-September 1976 and 1977

Country and period	Beginning inventory	Production	Subtotal	Exports	Domestic consumption	Ending inventory
			Metric tons			
1976						
FEO countries 1/						
Chile	27,041	167,913	194,954	138,641	6,894	48,673
Iceland	1,802	95,589	97,391	82,222	3,600	11,569
Norway	114,246	387,234	501,480	319,549	15,803	166,128
Peru	40,136	641,497	681,633	474,468	104,668	102,497
South Africa	1,780	208,273	210,053	41,145	130,100	38,808
FEO total	185,005	1,500,506	1,685,511	1,056,025	261,065	367,675
Other countries						
Canada	5,388	36,111	41,499	24,202	12,412	5,677
Denmark	15,000	270,000	285,000	226,700	51,065	12,000
Grand total	205,393	1,806,617	2,012,010	1,306,927	325,077	385,352
1977						
FEO countries 1/						
Chile	36,352	175,157	211,509	119,352	8,763	83,904
Iceland	3,665	142,385	146,050	113,264	3,600	29,085
Norway	139,358	384,276	523,634	323,492	17,853	182,289
Peru	148,033 2/	301,398	449,431	307,576	88,894	52,961
South Africa	1,908	171,400	173,308	9,165	124,627	39,516
FEO total	329,316	1,174,616	1,503,932	872,849	243,737	387,755
Other countries						
Canada	3,589	34,436	38,025	18,689	14,289	5,454
Denmark	7,000	253,000	260,000	214,400	38,600	14,000
Grand total	339,905	1,462,052	1,801,957	1,105,938	296,626	407,209

1/ Excluding Angola, for which figures are not available.
2/ Revised from source to be consistent with other Peruvian figures shown.

Source: Fishmeal Exporters Organization (FEO), Paris; Oil World Weekly, published by ISTA Mielke & Co., Hamburg; Canada, Fisheries and Marine Service, Ottawa; and other sources.

Note: Figures are preliminary, and may include slight discrepancies, owing to revisions, to differences in definition or reporting practices among sources and countries, and to other possible reasons. Figures for Denmark are partially estimated.

Table A 7.--FEO exports of fish meal by country of destination, January-September 1976-77

Country of destination	Exports		Percentage of total FEO exports		Percentage change from 1976 to 1977
	1976	1977	1976	1977	
	-Thousand metric tons-		-Percent-		
Denmark	5.3	7.0	0.5	0.8	+ 32.1
France	38.2	38.1	3.6	4.4	- 0.3
Germany, West	194.2	122.5	18.4	14.0	- 36.9
Holland/Belgium	35.6	35.8	3.4	4.1	+ 0.6
Italy	63.2	27.3	6.0	3.1	- 56.8
U.K./Eire	76.3	57.8	7.2	6.6	- 24.2
Scandinavian countries 1/	75.6	73.6	7.2	8.4	- 2.6
East European countries	282.2	243.2	26.7	27.9	- 13.8
U.S.S.R.	7.0	14.2	0.7	1.6	+ 102.9
United States 2/	66.0	13.0	6.3	1.5	- 80.3
Cuba	24.0	19.4	2.3	2.2	- 19.2
Latin American countries 3/	23.4	6.62	2.2	0.8	- 71.7
China, P.R.	24.3	-	2.3	-	- 100.0
Iran	20.4	20.7	1.9	2.4	+ 1.5
Israel	5.8	15.9	0.5	1.8	+ 174.1
Japan	38.1	114.4	3.6	13.1	+ 200.3
Philippines	15.9	8.2	1.5	0.9	- 48.4
Taiwan	9.0	18.3	0.9	2.1	+ 103.3
Other	51.4	36.53	4.9	4.2	- 28.9
Total	1,056.0	872.8	100.0	100.0	- 17.3

1/ Does not include Denmark.
2/ Based on export figures reported by FEO countries.
3/ Includes Haiti; does not include Cuba.

Note: Recipient countries and categories are those given by FEO.

Source: Fishmeal Exporters Organization (FEO).

Table A8.--Selected average monthly wholesale prices and price ratio of fish meal to soybean meal, 1975-77

Period	Menhaden 1/	Tuna 2/	Imported 3/ Peruvian	Northwest Europe 4/	Soybean 5/ 44% protein	Soybean 5/ 50% protein	Peruvian fish meal to 50% protein soybean meal
	-Dollars per short tons-						-Price ratio-
1975							
January	263.12	220.00	6/ 262.50	251.29	129.20	137.90	1.90
February	231.25	207.96	6/ 231.90	205.02	117.25	126.90	1.83
March	220.50	193.88	220.50	201.40	117.75	126.50	1.74
April	238.75	206.25	240.00	216.82	122.00	131.80	1.82
May	226.87	207.62	223.12	197.77	118.50	129.00	1.73
June	218.75	211.80	216.25	192.32	120.90	130.75	1.65
July	234.50	213.78	226.25	204.12	124.00	134.20	1.69
August	246.25	219.66	255.83	215.00	134.40	144.20	1.78
September	259.00	218.74	259.00	206.84	133.70	144.30	1.79
October	266.25	202.12	265.00	235.87	125.90	135.90	1.95
November	6/ 269.38	198.00	265.00	271.25	119.90	126.80	2.09
December	6/ 266.25	201.50	265.00	273.06	125.10	132.30	2.00
Average	245.07	208.44	244.20	222.56	124.05	133.40	1.83
1976							
January	6/ 268.75	201.00	270.00	274.88	128.25	136.25	1.98
February	6/ 270.00	206.94	270.62	275.79	132.60	139.25	1.94
March	6/ 273.75	210.87	271.25	273.97	127.90	135.60	2.00
April	253.12	210.25	270.62	274.88	127.10	136.40	1.98
May	283.00	217.25	285.00	300.28	152.25	161.75	1.76
June	353.00	273.30	344.00	336.57	187.90	200.30	1.76
July	385.00	299.13	381.25	367.96	193.90	207.88	1.83
August	324.00	275.00	348.00	360.61	173.30	187.10	1.86
September	361.25	280.25	358.75	420.79	179.20	192.50	1.86
October	6/ 361.88	272.94	351.88	404.38	169.60	182.00	1.93
November	6/ 367.00	286.00	366.50	407.78	181.20	193.30	1.90
December	6/ 396.88	295.62	388.75	415.49	197.60	212.60	1.83
Average	324.80	252.37	325.55	341.10	162.57	173.74	1.87
1977							
January	412.50	323.13	404.50	423.43	207.00	224.25	1.80
February	423.75	357.50	416.67	410.05	211.00	230.38	1.81
March	433.33	364.38	6/ 431.25	401.16	226.20	246.60	1.80
April	6/ 483.13	367.82	6/ 479.38	438.86	275.63	299.00	1.60
May	486.00	390.50	482.50	458.81	258.25	283.50	1.70
June	423.75	405.97	435.00	433.09	225.30	247.10	1.76
July	327.50	275.00	358.75	405.29	162.00	182.75	1.96
August	318.75	247.50	325.00	346.77	140.30	160.90	2.02
September	331.25	244.06	335.00	369.95	143.65	162.40	2.06
October	349.00	304.13	345.00	414.13	135.00	150.75	2.29
November	363.13	275.00	358.33	419.12	161.70	177.90	2.01
December							

1/ 60 percent protein, bulk, quoted by brokers at New York City, f.o.b. East Coast and Gulf plants.
2/ 55 percent protein, bulk, Los Angeles. To March 1975 known as tuna and mackerel, now known also as tuna-mix. Prior to July 1975 reported with 60 percent protein content.
3/ 65 percent protein, bulk f.o.b., East Coast and Gulf ports.
4/ 65 percent protein, any origin, c & f Hamburg, West Germany.
5/ Bulk at Decatur, Ill.
6/ Nominal price.

Source: For prices of fish meal in the United States: NMFS, Data Management and Statistics Division. For Hamburg prices: Oil World, ISTA Mielke & Co., Hamburg, West Germany. For soybean meal prices: Feed Market News, U.S. Department of Agriculture, Consumer and Marketing Service, Grain Division.

Table A9.--Production and average price of fish solubles, by month, 1966-75 average and 1975-77

Month	Production				Price 1/			Menhaden meal to menhaden solubles		
	1966-75 average	1975	1976	1977	1975	1976	1977	1975	1976	1977
	Thousand short tons				Dollars per short ton			Price ratio		
January	1.4	3.3	3.1	1.9	86.25	2/ 75.00	2/ 140.00	3.05	3.58	2.95
February	1.4	1.5	1.4	1.5	77.50	2/ 75.00	2/ 144.38	2.98	3.60	2.93
March	2.3	2.8	3.5	5.0	75.00	80.62	2/ 147.50	2.94	3.39	2.94
1st quarter	5.1	7.6	8.0	8.4	79.58	76.87	143.96	2.99	3.52	2.94
April	5.0	7.0	8.4	7.4	73.75	79.38	2/ 166.88	3.32	3.19	2.90
May	11.4	20.3	10.1	11.4	71.25	93.75	2/ 177.00	3.18	3.02	2.75
June	17.4	19.9	17.1	18.9	64.06	118.50	2/ 176.25	3.41	2.98	2.40
2d quarter	33.8	47.2	35.6	37.6	69.69	97.21	173.38	3.27	3.06	2.68
July	18.7	21.2	25.4	18.8	63.50	138.75	2/ 149.38	3.69	2.77	2.19
August	17.5	14.0	22.2	18.4	61.88	2/128.00	2/ 128.50	3.98	2.53	2.48
September	11.8	14.2	18.4	19.1	66.00	2/127.50	2/ 131.25	3.92	2.83	2.52
3d quarter	48.0	49.4	66.0	56.2	63.79	131.41	136.38	3.86	2.71	2.39
October	8.8	14.8	9.0	10.5	71.88	2/129.50	2/ 126.00	3.70	2.79	2.77
November	5.9	4.0	9.8		2/73.12	2/129.00	2/ 127.50	3.68	2.84	2.85
December	3.7	4.7	4.4		2/74.69	2/135.00		3.56	2.94	
4th quarter	18.4	23.5	23.2		73.23	130.50		3.65	2.88	
Total	105.5	127.8	132.9		3/66.40	3/123.85		4/3.60	4/ 2.80	

1/ Menhaden solubles in tank cars; price quoted by brokers at New York City, f.o.b. East Coast plants.
2/ Nominal price.
3/ Weighted average.
4/ Menhaden meal to menhaden solubles weighted average.

Note: Figures may not add to total because of rounding.
1977 figures subject to revision.

Source: NMFS, Data Management and Statistics Division.

Table A10.--U.S. production of fish oil, by month, 1966-75 average, and 1975-77

Time period	Anchovy			Menhaden			Tuna and mackerel			Other			Total			
	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1976	1977	1966-75 average	1975	1976	1977
	-Million pounds-															
January	0.4	1.0	0.1	-	0.1	0.1	0.3	0.5	0.3	0.3	0.1	0.1	0.9	1.8	1.6	0.5
February	.1	0.2	1/	-	-	-	.2	.3	.3	.2	.2	.2	.5	0.6	0.7	0.5
March	-	0.2	1/	-	-	-	.4	.6	.3	.3	.1	.1	.7	.9	0.9	0.5
1st quarter	.5	1.4	0.1	-	0.1	0.1	.9	1.4	.9	.8	.4	.4	2.2	3.3	3.2	1.5
April	.2	2/	1/	8.3	4.5		.4	.5	.4	.6	.2	.3	5.3	3.9	9.0	5.1
May	.1	-	1/	21.4	18.0	13.5	.4	.5	2.4	.7	.2	.3	22.7	39.1	18.7	16.2
June	-	-	-	33.8	31.3	28.1	.4	.4	.3	1.0	.5	.8	35.3	39.5	32.2	29.2
2d quarter	.3	2/	1/	59.4	57.6	46.1	1.3	1.4	3.1	2.3	1.0	1.3	63.3	82.5	60.0	50.5
July	-	-	-	39.0	38.4	22.0	.5	.5	.4	1.9	.6	1.2	41.4	56.2	39.5	23.7
August	.1	-	-	35.9	41.9	16.4	.6	.6	.4	2.0	1.3	.7	38.5	36.5	43.8	17.5
September	.5	.5	1.5	23.1	36.8	19.5	.6	.5	.4	2.0	1.5	.8	26.2	36.7	39.4	22.1
3d quarter	.6	.5	1.5	98.0	117.2	57.8	1.6	1.6	1.2	5.9	3.4	2.8	106.0	129.4	122.6	63.2
October	1.2	.9	1.9	11.5	10.0	7.6	.6	.6	.4	1.3	1.6	1.0	14.6	20.7	13.0	10.9
November	1.4	1.5		6.2	1.6		.5	.5		.5	.1		8.6	5.3	3.7	
December	1.0	1.1		2.3	-		.4	.8		.4	.1		4.1	4.6	2.0	
4th quarter	3.7	3.5		20.1	11.6		1.5	1.9		2.2	1.8		27.4	30.5	18.7	
Total	5.0	5.3		177.5	186.4		5.2	6.3		11.2	6.5		198.9	245.7	204.6	

1/ Included with "other".
2/ Less than 50,000 pounds.

Note: Figures may not add to total because of rounding.
1977 figures subject to revision.

Source: NMFS, Data Management and Statistics Division.

Table A11.-- U.S. exports, domestic industrial use, and total disappearance of fish oil, by month, 1966-75 average, and 1975-77

Time period	Exports 1/				Domestic disappearance 2/				Total disappearance			
	1966-75 average	1975	1976	1977	1966-75 average	1975	1976	1977	1966-75 average	1975	1976	1977
	-Million pounds-											
January	10.4	13.0	9.0	0.7	2.4	2.7	2.9	2.2	12.8	15.7	11.8	2.9
February	4.7	0.1	1.1	1.0	2.6	2.1	3.1	2.7	7.3	2.2	4.2	3.7
March	8.0	.1	3.2	3.7	2.5	2.3	3.3	3.3	10.5	2.5	6.5	7.0
1st quarter	23.1	13.3	13.3	5.4	7.5	7.1	9.3	8.1	30.6	20.4	22.6	13.6
April	3.8	4.7	0.1	3/	2.8	2.5	3.7	3.2	6.6	7.2	3.8	3.2
May	5.4	3/	5.1	1.5	2.6	2.4	3.3	3.3	8.0	2.4	8.5	4.8
June	14.0	33.8	12.4	15.0	2.9	2.9	3.5	2.6	16.6	36.7	15.9	17.7
2d quarter	23.0	38.5	17.7	16.6	8.3	7.7	10.5	9.1	31.5	46.3	28.2	25.6
July	23.4	29.1	33.1	16.1	2.8	3.2	2.3	2.8	26.2	32.3	35.4	18.9
August	28.0	33.9	35.0	31.5	3.0	4.2	3.4	3.0	31.0	38.1	38.5	34.6
September	17.1	4.8	42.1	5.7	3.1	4.0	3.9	3.4	20.2	8.8	46.1	9.0
3d quarter	68.5	67.8	110.3	53.3	8.9	11.4	9.7	9.2	77.4	79.2	119.9	62.5
October	19.3	14.2	16.5	6.9	2.6	3.9	3.0	2.4	21.9	18.1	19.5	9.3
November	12.2	18.9	14.6		2.6	3.7	3.1		14.8	22.6	17.8	
December	17.3	39.2	6.8		2.4	3.0	2.8		19.7	42.2	9.7	
4th quarter	48.8	72.3	37.9		7.6	10.6	9.0		56.4	82.9	46.9	
Total	163.7	191.9	179.2		32.3	36.8	38.4		196.0	228.7	217.7	

1/ Excluding whale oil.
2/ Includes marine mammal oil other than sperm oil and some hydrogenated fat (vegetable and animal) and other fats and oils in process.
3/ Less than 50,000 pounds.

Source: Bureau of the Census. Current Industrial Report, Fats and Oils, Production Consumption and Stocks Series: M20K (66-76). U.S. Department of Commerce, Bureau of the Census.

Note: Figures may not add to total because of rounding.

Table A12.--Selected average monthly prices of fish and soybean oils, and price ratio of menhaden oil to soybean oil, 1975-77

Time period	Anchovy 1/	Menhaden 2/	Tuna and mackerel 3/	Northwest Europe 4/	Soybean 5/	Menhaden oil to soybean oil
	Cents per pound					Price ratio
1975						
January	20.0	25.0	15.5	23.1	33.6	.74
February	18.9	7/ 20.0	15.5	19.2	29.4	.68
March	15.2	6/	10.0	16.6	29.1	-
April	15.0	6/	7.2	14.9	28.2	-
May	15.0	13.5	7.4	12.8	23.6	.57
June	15.0	13.0	7.5	13.0	23.3	.56
July	6/	13.5	7.5	14.7	27.5	.49
August	6/	14.6	7.5	14.6	28.4	.51
September	14.5	15.0	7.6	13.9	24.3	.62
October	14.1	15.2	7.7	14.1	21.4	.71
November	13.1	15.2	7.1	15.1	18.9	.80
December	11.6	15.5	6.8	15.1	16.8	.92
Average	15.2	16.0	8.9	15.6	25.4	.66
1976						
January	12.5	6/	7.6	14.6	16.2	-
February	12.5	6/	8.0	14.7	16.3	-
March	6/	15.2	6/	15.2	16.6	.92
April	6/	15.2	8.0	14.8	16.3	.93
May	6/	15.4	6/	15.3	15.8	.97
June	6/	15.4	6/	16.6	17.3	.89
July	6/	18.0	6/	18.5	20.9	.86
August	14.0	16.6	6/	17.2	20.4	.81
September	14.0	18.0	6/	18.6	22.5	.80
October	14.0	18.7	6/	19.0	20.7	.90
November	14.0	18.6	9.2	19.2	21.8	.85
December	14.0	18.5	9.5	19.1	21.0	.88
Average	13.6	17.0	8.5	16.9	18.8	.90
1977						
January	14.0	18.6	9.3	19.4	20.9	.89
February	14.0	19.2	9.5	20.0	22.4	.86
March	14.0	21.3	9.4	22.5	26.5	.80
April	14.0	23.9	9.5	25.3	29.6	.81
May	14.0	25.6	9.5	26.2	31.3	.82
June	6/	25.6	12.0	24.4	28.3	.90
July	6/	21.4	12.4	21.1	23.8	.90
August	6/	20.0	12.5	19.7	21.1	.95
September	6/	20.0	12.6	18.7	19.2	1.04
October	15.1	19.0	12.8	19.8	18.8	1.01
November	15.5	18.8	11.0	19.2		

1/ Crude oil, f.o.b. plants, quoted at Los Angeles.
2/ Crude oil in tank cars; f.o.b. East Coast plants, quoted at New York City.
3/ Crude oil, f.o.b. plants quoted at Los Angeles.
4/ Crude oil, any origin, at Hamburg.
5/ Crude, tank cars, f.o.b, at Decatur, Ill.
6/ Supplies exhausted, no quotes.
7/ Nominal price.

Source: For NW. Europe prices: Oil World ISTA Mielke & Co., Hamburg, West Germany.
For soybean oil prices: Fats and Oils Situation, U.S. Department of Agriculture.

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